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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,847	08/29/2003	Peter Miguel Martino	200309657-1	2821
22879	7590	12/07/2005	EXAMINER	
HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			SEMENENKO, YURIY	
			ART UNIT	PAPER NUMBER
			2841	

DATE MAILED: 12/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**Application No. **10/652,847**

Applicant(s)

MARTINO, PETER MIGUEL

Examiner

Yuriy Semenenko

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 16-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                | Paper No(s)/Mail Date. ____   |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/27/03</u> pages <u>3</u> .   | 6) <input type="checkbox"/> Other: ____                                     |

## DETAILED ACTION

### *Election/Restrictions*

1. Affirmation of election is acknowledged. Applicant elects without traverse of Group I Claim 1-10 and 16-20 drawn to a land grid array package in reply filed on 10/14/2005. Claims 1-10 and 16-20 are under consideration. Claims 11-15 are withdrawn from consideration. Claims 1-20 are pending in this Application.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2.1. Claims 1, 16, 18 and 19 are rejected under 35U.S.C. 103(a) as being obvious over Coffin et al. (Patent # 2002/0079117 hereinafter "Coffin") in view of Kutlu (Patent # 6472762 hereinafter "Kutlu").

2.1.1. Regarding claim 1: Coffin discloses in Fig. 1 a land grid array package 10 for clamping to an interposer socket 14 on a printed circuit board 16, the LGA package (LGA) 12 (page 2, [0020]) comprising: a substrate 34, Fig. 2B; a die 32, attached to an upper surface of the substrate; a lid 36, Fig. 2B attached to an upper surface of the die 32,

except, Coffin doesn't explicitly teach a substrate reinforcement member attached to the upper surface of the substrate and separated from the lid.

Kutlu discloses a substrate reinforcement member 116, Fig. 4 attached to the upper surface of the substrate 106 and separated from the lid 104. At time the invention was made, it was well known to use a substrate reinforcement member attached to the upper surface of the substrate and separated from the lid.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention that a substrate reinforcement member attached to the upper surface of the substrate and separated from the lid.

Benefit of separating a substrate reinforcement member from the lid is eliminate of necessity to match the coefficient of thermal expansion (CTE).

2.1.2. Regarding claim 16: Coffin discloses in Fig. 1 a land grid array package 10, the LGA package (LGA) 12 (page 2, [0020]) comprising: a substrate 34, Fig. 2B; a die 32, attached to an upper surface of the substrate; a lid 36, Fig. 2B attached to an upper surface of the die 32,

except, Coffin doesn't explicitly teach a substrate reinforcement member attached to the a surface of the substrate and being adapted to reduce mechanical stress in the substrate.

Kutlu discloses a substrate reinforcement member 116, Fig. 4 attached to a surface of the substrate 106 and being adapted to reduce mechanical stress in the substrate (column 2, lines 8-22). At time the invention was made, it was well known to use a substrate reinforcement member attached to the upper surface of the substrate and being adapted to reduce mechanical stress in the substrate.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention that a substrate reinforcement member attached to the upper surface of the substrate and being adapted to reduce mechanical stress in the substrate.

Benefit of doing so is to reduce mechanical stress in the substrate.

2.1.3. Regarding claim 18: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 16,

except , Coffin doesn't explicitly teach wherein the lid is adapted to move downwardly to accommodate bending of the substrate.

Kutlu discloses the lid 104 is adapted to move downwardly to accommodate bending of the substrate 106. [This is possible because the substrate reinforcement member attached to the surface of the substrate separated from the lid, Fig. 4]. At time the invention was made, it was well know to use the lid is adapted to move downwardly to accommodate bending of the substrate.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention the lid is adapted to move downwardly to accommodate bending of the substrate .

Benefit of separating a substrate reinforcement member from the lid is eliminate of necessity to match the coefficient of thermal expansion (CTE).

2.1.4. Regarding claim 19: Further Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 16,

except , Coffin doesn't explicitly teach the substrate reinforcement member extends around a periphery of the die.

Kutlu discloses the substrate reinforcement member 116 extends around a periphery of the die 102, Fig. 4. At time the invention was made, it was well know to use the substrate reinforcement member extends around a periphery of the die.

Therefore it would have been obvious to one of ordinary skill in the art, at time the

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invention was made, for Coffin to include in his invention that the substrate reinforcement member extends around a periphery of the die to provide stiffness.

2.2. Claims 2, 8 and 17 are rejected under 35U.S.C. 103(a) as being obvious over Coffin in view of Kutlu and in view of Baba (Patent # 6313521 hereinafter "Baba").

2.2.1. Regarding claim 2: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 1, wherein the substrate reinforcement member attached to the upper surface of the substrate around the periphery of the lid,

except, Coffin doesn't explicitly teach the substrate reinforcement member comprises a ring.

Baba discloses in Fig. 3 the substrate reinforcement member comprises a ring 10. Therefore, at time the invention was made, it was well know to use the substrate reinforcement member comprises a ring.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention the substrate reinforcement member comprises a ring to provide stiffness.

2.2.2. Regarding claim 8: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 1,

except, Coffin doesn't explicitly teach the substrate reinforcement member is parallel and adjacent to sides of the lid.

Baba discloses in Fig. 3 the substrate reinforcement member is parallel and adjacent to sides of the lid. Therefore, at time the invention was made, it was well know to use the substrate reinforcement member is parallel and adjacent to sides of the lid.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention the substrate reinforcement member is parallel and adjacent to sides of the lid to provide stiffness.

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2.2.3. Regarding claim 17: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 16,

except, Coffin doesn't explicitly teach the substrate reinforcement member has a rectangular cross section.

Baba discloses in Fig. 3 the substrate reinforcement member has a rectangular cross section. Therefore, at time the invention was made, it was well know to use the substrate reinforcement member has a rectangular cross section.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention the substrate reinforcement member has a rectangular cross section to provide stiffness.

2.3. Claims 3 and 10 are rejected under 35U.S.C. 103(a) as being obvious over Coffin in view of Kutlu and in view of McCutcheon (Patent #5958556 hereinafter "Mccutcheon").

2.3.1. Regarding claim 3: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 1,

except , Coffin doesn't explicitly teach the substrate reinforcement member comprises at least one longitudinal bar.

McCutcheon discloses in Fig. 1 the substrate 8 reinforcement member comprises at least one longitudinal bar 2. Therefore, at time the invention was made, it was well know to use the substrate reinforcement member comprises at least one longitudinal bar.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention the substrate reinforcement member comprises at least one longitudinal bar to provide stiffness.

2.3.2. Regarding claim 10: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 1,

except , Coffin doesn't explicitly teach the substrate reinforcement member has an elongated bar shape.

McCutcheon discloses in Fig. 1 the substrate reinforcement member has an elongated bar shape 2. Therefore, at time the invention was made, it was well known to use the substrate reinforcement member has an elongated bar shape.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention the substrate reinforcement member has an elongated bar shape to provide stiffness.

2.4. Claim 5 is rejected under 35U.S.C. 103(a) as being obvious over Coffin in view of Kutlu and in view of Toy et al. (Patent # 6333460 hereinafter "Toy").

2.4.1. Regarding claim 5: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 1,

except, Coffin doesn't explicitly teach the lid comprises one of AlSiC-9, CuW, and SiC.

Toy discloses also discloses in the "Background of the invention" section, at the time the invention was made, it was well known to use the lid comprises one of AlSiC-9, CuW, and SiC (column 2, lines 5-11).

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention the lid comprises one of AlSiC-9, CuW, and SiC to provide better matching of the coefficient of thermal expansion (CTE) chip and lid.

2.5. Claims 4, 6 and 7 are rejected under 35U.S.C. 103(a) as being obvious over Coffin in view of Kutlu and in view of Gungor et al. (Patent #5944097 hereinafter "Gungor").

2.5.1. Regarding claim 4: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 1,

except, Coffin doesn't explicitly teach the substrate reinforcement member comprises one of Invar and SiC.



Gungor discloses in Fig. 2 the substrate 16 reinforcement member 10 comprises one of Invar and SiC. Therefore, at time the invention was made, it was well known to use the substrate reinforcement member comprises one of Invar and SiC.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention the substrate reinforcement member comprises one of Invar and SiC, to provide stiffness.

2.5.2. Regarding claim 6: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 1,

except, Coffin doesn't explicitly teach a coefficient of thermal expansion of the substrate reinforcement member is substantially equal to a coefficient of thermal expansion of the substrate.

Gungor discloses a coefficient of thermal expansion of the substrate reinforcement member is substantially equal to a coefficient of thermal expansion of the substrate (column 3, lines 54-67 and column 4, lines 1-7). Therefore, at time the invention was made, it was well known to use a coefficient of thermal expansion of the substrate reinforcement member is substantially equal to a coefficient of thermal expansion of the substrate.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention a coefficient of thermal expansion of the substrate reinforcement member is substantially equal to a coefficient of thermal expansion of the substrate in order to match CTE of the substrate and the substrate reinforcement member.

2.5.3. Regarding claim 7: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 1, and comprising the substrate 106, Fig. 4 (see Kutlu) and in an adhesive 108 that attaches the lid 104 to the upper surface of the die 102. As discussed above in respect of claim 6 coefficients of thermal expansion of the substrate and the substrate reinforcement member are matched. As a result of matching coefficients of thermal expansion mechanical stress in such structure is reduced and mechanical stress in the substrate and in an adhesive that attaches the lid to the upper surface of the die reduced also as parts of the structure.

2.5. Claims 9 and 20 are rejected under 35U.S.C. 103(a) as being obvious over Coffin in view of Kutlu and in view of Alcoe et al. (Patent #2002/0135063 hereinafter "Alcoe").

2.5.1. Regarding claim 9: Coffin discloses LGA package having all of the claimed features as discussed above with respect claim 1,

except Coffin doesn't explicitly teach the substrate reinforcement member comprises four separate bars.

Alcoe discloses in Fig. 4 the substrate 10 reinforcement member comprises four separate bars 20. Therefore, at time the invention was made, it was well known to use the substrate reinforcement member comprises four separate bars.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention the substrate reinforcement member comprises four separate bars to provide stiffness.

2.5.2. Regarding claim 20: Coffin, as modified, discloses LGA package having all of the claimed features as discussed above with respect claim 16, wherein the substrate reinforcement member are adjacent to and separate from the lid,

except Coffin doesn't explicitly teach the substrate reinforcement member comprises two separate members.

Alcoe discloses in Fig. 4 the substrate 10 reinforcement member comprises two separate members 20. Therefore, at time the invention was made, it was well known to use the substrate reinforcement member comprises two separate members.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Coffin to include in his invention the substrate reinforcement member comprises two separate members to provide stiffness.

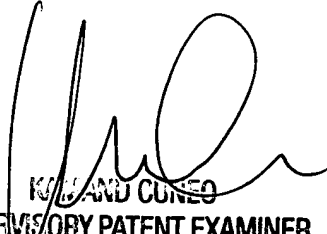
3.1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

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3.2. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571)- 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

3.3. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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